Space Weather Forecast

Issued on Saturday, 09 September 2023 at 01:14 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Moderate-class flares (R1-R2 radio blackouts). Slight chance of Coronal Mass Ejection (CME) arriving late on Day 1 (09 Sept).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low over the past 24 hours, with only Common-class flares observed from a sunspot region located in the northeast quadrant of the disc, which has recently produced a filament eruption (arc of plasma) lifting off the disc, which may produce a Coronal Mass Ejection (CME) awaiting imagery for analysis. There are currently five sunspot groups on the visible disc. Two of these are relatively large. The most complex one is in the northeast, near centre-disc, but remains largely inactive. Also, the aforementioned region, also in the northeast, which shows some magnetic complexity. The other one, in the northwest, is becoming less extensive and magnetically simpler, with most spots fading. The other regions are relatively small and simple. No Earth-directed CMEs have been observed in coronagraph imagery in the past 24 hours.

Solar Wind / Geomagnetic Activity: Solar wind parameters were indicative of a slow regime. Solar wind speeds were mostly around 340-380km/s. The Interplanetary Magnetic Field (IMF) was weak throughout. The north-south component varied weakly. Geomagnetic activity was Quiet (Kp 0-2), with only one Unsettled interval (08/0000-0300UTC).

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: There is a chance of Moderate-class flares throughout the period, mostly from the more complex sunspot regions.

Solar Wind / Geomagnetic Activity: The CME that left the Sun on the 05th may arrive at Earth late on Day 1 (09 Sep) or early on Day 2 (10 Sep) with a chance of geomagnetic enhancements. However, it is worth noting that its analysis was contaminated by other CMEs occurring in the background, thus reducing confidence. No other Earth-directed CMEs have been observed in the last 24 hours. With an absence of significant coronal holes on the western hemisphere, the solar wind is most likely to remain slow-ambient, with no significant or long-lasting enhancement.

Geomagnetic activity is expected to be mostly Quiet to Unsettled, but with a risk of becoming Active with a slight chance of isolated G1/Minor Storm intervals late on Day 1 into Day 2 (09-10 Sep), under the influence of the CME that left the Sun on the 05th.

Energetic Particles / Solar Radiation: Solar radiation storms are unlikely, with a very slight chance of an enhancement should any larger flares occur from the larger regions on the disc, especially later in the period.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	10	5	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	40	40	40	40
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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